AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A composite porous membrane comprising:

a hydrophobic substrate having an average pore size ranging from about 0.01 μm to about 10 μm coated with difunctional surface-modifying molecules;

each difunctional surface-modifying molecule comprising a hydrophobic portion preferentially associated with the substrate and a hydrophilic portion and having an active group containing a carbon-carbon double bond;

the difunctional surface-modifying molecules consisting of a difunctional acrylate monomer with molecular weight less than 10,000 Dalton;

wherein the difunctional acrylate monomer comprise greater than about 90% of the molecules associated with the membrane;

wherein the substrate is coated by flowing a reagent solution through the substrate to coat the substrate surface and inner surfaces of the pores, the reagent solution comprising the difunctional surface-modifying molecules and a photoinitiator, wherein the reagent solution is capable of flowing through the substrate; and

wherein the surface-modifying molecules are crosslinked to form a crosslinked hydrophilic polymeric network at the substrate surface and inner surfaces of the pores of the membrane, and wherein the pore size of the coated membrane is substantially the same as the pore size of the porous membrane before coating.

2. (Original) The membrane according to claim 1, wherein the hydrophilic portion of the surface-modifying molecules comprises at least two crosslinking active groups.

3. (Original) The membrane according to claim 2, wherein the crosslinking active group comprises a carbon-carbon double bond.

4. (Canceled)

5. (Original) The membrane according to claim 1, wherein 100% of molecules associated with the substrate comprise difunctional surface-modifying molecules.

6. (Previously Presented) The membrane according to claim 1, wherein the hydrophobic portion is a hydrophobic alkyl, aromatic group, or olefinic hydrocarbon group.

7. (Previously Presented) The membrane according to claim 1, wherein the hydrophobic portion comprises an aromatic hydrocarbon molecule.

8. (Original) The membrane according to claim 7, wherein the aromatic hydrocarbon comprises a bisphenol A group.

9. (Previously Presented) The membrane according to claim 1, wherein the hydrophobic portion does not form covalent bonds with the surface.

10. (Previously Presented) The membrane according to claim 1, wherein the hydrophilic portion is positively charged.

11. (Previously Presented) The membrane according to claim 1, wherein the hydrophilic portion is negatively charged.

12. (Previously Presented) The membrane according to claim 1, wherein the hydrophilic portion comprises a neutral charge.

13. (Previously Presented) The membrane according to claim 1, wherein the hydrophilic portion comprises the general formula $[-X_{n1}-Y-CR=CH_2]_{n2}$ where X is independently selected from the group consisting of (-CH2-CH2-O-); (-CH2-O-); (-CH2-CH(COOH)-); (-CH2-CH(OH)-); Y is selected from the group consisting of $([-CH2-]_{n3})$; (-COO); n_1 is from about 1-50; n_2 is from about 1-2; and n_3 can be from about 1 to about 50.

14. (Original) The membrane according to claim 1, wherein the difunctional surface modifying molecules are polymerized on the substrate surface after being preferentially adsorbed with the substrate surface.

15. (Original) The membrane according to claim 1, wherein the difunctional surface molecules comprise ethoxylated (30) bisphenol A diacrylates.

16. (Previously Presented) The membrane according to claim 1, wherein the difunctional-surface molecules are polymerized using a photoinitiator, and wherein the photoinitiator is preferentially adsorbed by the substrate surface.

17. (Previously Presented) The membrane according to claim 1, wherein the difunctional-surface molecules are polymerized using a photoinitiator that comprises a substantially hydrophobic molecule.

18. (Previously Presented) The membrane according to claim 1, wherein the difunctional-surface molecules are polymerized using a photoinitiator selected from the group consisting of 1-hydroxy-cyclohexyl-phenyl-ketone; 2-benzyl-2-dimethylamino-1-(4-morpholinophenyl)-butanone-1; 50% 1-hydroxy-cyclohexyl-phenyl-ketone and 50% benzophenone; 25% bis(2,6-dimethoxybenzoyl)-2,4,4-trimethyl pentylphosphineoxide and 75% 2-hydroxy-2-methyl-1-phenyl-propan-1-one; 2,2-dimethoxy-1,2-diphenylethan-1-one; bis(2,4,6-trimethylbenzoyl)-phenylphosphineoxide; 80% 2-hydroxy-2-methyl-1-phenyl-propan-1-one and 20% 1-hydroxy-cyclohexyl-phenyl-ketone; 25% bis(2,6-dimethoxybenzoyl)-2,4,4-trimethyl-pentylphosphineoxide and 75% 1-hydroxy-cyclohexyl-phenyl-ketone; 2-hydroxy-2-methyl-1-phenyl-propan-1-one; benzophenone; 50% 2,4,6-trimethylbenzoyl-diphenyl-phosphineoxide and 50% 2-hydroxy-2-methyl-1-phenyl-propan-1-one; bis(□5-2,4-cyclopentadien-1-yl)-bis(2,6-dicluoro-3-(1H-pyrrol-1-yl)-phenyl)titanium; 2-methyl-1[4-(methylthio)phenyl]-2-morpholinopropan-1-one; 30% 2-benxyl-2-dimethylamino-1-(4-morpholinophenyl)-butanone-1 and 70% 2,2-dimethoxy-1,2-diphenylethan-1-one; and 1-[4-(2-hydroxyethoxy)-phenyl]-2-hydroxy-2-methyl-1-propane-1-one.

19. (Original) The membrane according to claim 1, wherein the membrane has an average pore size of from about greater than 0 μm to about 10 μm.

20. (Original) The membrane according to claim 1, wherein the hydrophobic substrate comprises polyvinylidene fluoride.

21. (Original) The membrane according to claim 1, wherein the membrane is wettable within less than about 30 seconds after drying upon contacting with an aqueous solution.

22. (Original) The membrane according to claim 1, wherein the membrane is autoclavable.

23-47 (Canceled).

48. (Previously Presented) The membrane according to claim 1, wherein the hydrophobic portion is capable of significant association with the substrate.

49. (Canceled)

50. (Currently amended) A composite porous membrane comprising a hydrophobic substrate having an average pore size ranging from about 0.01 μm to about 10 μm coated with difunctional surface-modifying molecules, each difunctional surface- modifying molecule comprising a hydrophobic portion preferentially associated with the substrate and a hydrophilic portion, the difunctional surface-modifying molecules comprising difunctional acrylate molecules with molecular weight less than 10,000 Dalton, wherein the substrate is coated by flowing a reagent solution through the substrate to coat the substrate, the reagent solution being capable of flowing through the substrate and comprising the difunctional surface-modifying molecules and a photoinitiator, wherein the difunctional surface-modifying molecules are preferentially absorbed on the substrate surface and, thereafter, the surface-modifying molecules are crosslinked to form a crosslinked hydrophilic polymeric network at the membrane surface

and inner surfaces of the pores ~~of the membrane~~, and wherein the pore sizes of the coated composite porous membrane is substantially the same as the pore size of the composite porous membrane before coating.

51. (Previously Presented) The membrane according to claim 1, wherein the coating is provided on the hydrophobic substrate by exposure to a reagent solution comprising less than 1% difunctional surface-modifying molecule.

52. (Previously Presented) The membrane according to claim 50, wherein the reagent solution requires less than 1% difunctional surface-modifying molecule to provide wettable membrane.

53. (Previously Presented) The membrane according to claim 51 or 52, wherein the reagent solution comprises less than about 0.5% difunctional surface-modifying molecule.

54. (Previously Presented) The membrane according to claim 51 or 52, wherein the reagent solution comprises less than about 0.25% difunctional surface-modifying molecule.

55. (Previously Presented) The membrane according to claim 1 or 50 wherein the flow rate through the pores of the coated membrane is substantially the same as the flow rate through the pores of the non-coated membrane.

56. (Previously Presented) The membrane according to claim 55, wherein the flow rate through the pores of the coated membrane is at least about 93% of the flow rate through the pores of the non-coated membrane.

57. (Previously Presented) The membrane according to claim 55, wherein the flow rate through the pores of the coated membrane is at least about 96% of the flow rate through the pores of the non-coated membrane.

58. (Currently amended) A composite porous membrane consisting essentially of a hydrophobic substrate coated with ethoxylated (30) bisphenol A diacrylates having molecular weight less than 10,000 Dalton, each ethoxylated (30) bisphenol A diacrylate comprising a hydrophobic portion preferentially associated with the substrate and a hydrophilic portion, wherein the ethoxylated (30) bisphenol A diacrylates are crosslinked to form a crosslinked hydrophilic polymeric network at the membrane surface and inner surfaces of the pores ~~of the membrane~~.

59. (Previously Presented) The membrane of claim 1 or 50 wherein the hydrophobic substrate has an average pore size of about 0.2 μm.

60. (Previously Presented) The membrane of claim 1 or 50 wherein the hydrophobic substrate has an average pore size of about 0.45 μm.